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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,744	03/20/2006	Albert K. Hinn	G33-114US	8278

21706 7590 12/07/2010

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EXAMINER	
GEBRIEL, SELAM T	
ART UNIT	PAPER NUMBER
2622	
MAIL DATE	DELIVERY MODE
12/07/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/561,744	HINN, ALBERT K.	
	Examiner	Art Unit	
	SELAM GEBRIEL	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-9,11 and 13-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-9,11 and 13-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 09/23/2010 have been fully considered but they are not persuasive.

Regarding claims 1 and 9 applicant argued the distinction between the reference used and the present invention.

The examiner respectfully disagrees for the followings reason. Regarding claim 1, Sefton discloses a camera carriage (Figures 1, 2, 3 Pipe inspection Device 1) with lighting equipment for inspecting piping (Figure 2 Illumination arrays 13 and 17), **the camera carriage comprising:** at least two cameras (Figure 2 Cameras 11 and 15) are disposed in a common housing (Figure 1 casing 5) and at least **one of said camera comprising** means for changing the viewing angle **of said cameras to bring each camera into a respective operative state for each camera; said means**[Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single rotation motor 29 mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is roll axis but also rotation of the sideways looking camera 15 about its pitch axis", Therefore the viewing angle of the cameras are changed), characterized in that the means (See Figure 2 and 3) are formed as gimbaled bearings of the housing (Figure 1 Casing 5) with motors (Figure 3 Rotation Motor 29)] for swiveling and/or rotating the housing about at least one first axis that is orthogonal to at the an axis

orthogonal to the longitudinal axis (6) of the carriage characterized in that the two cameras (10, 11) are located on the same optic axis (12) with identical **respective lines** of sight in the respective operative states of the cameras (Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single **rotation motor 29** mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is **roll axis** but also rotation of the sideways looking camera 15 about its **pitch axis**"). Sefton discloses on page 4 a semi-rigid rod system or a tractor type inspection apparatus is used for carriage of the inspection device but Sefton does not disclose a camera carriage with a running gear. Wasson disclose in figure 1a pipe inspection device arrays of lens 17 mounted on a running gears 42. Therefore it would have been obvious to one ordinary skilled in the art at the time the invention was made to incorporate the running gears of Wasson to the pipe inspection device of Sefton. The motivation to do is to simplify the maneuvering of the pipe inspection device.

Regarding claim 9 Sefton discloses a method for the inspection of pipe sections (Figure 1 Pipe inspection device 1) and/or the display of an inspection result (Page 4 first paragraph "If required an output signal from a sensor can steady the mage shown on the monitor") by means of a carriage (Figure 1 Pipe inspection device 1), characterized in that, in addition to the documentation of the inspection of details (Outputting signal from a sensor), (Page 3 and Page 4 Paragraph 1 "sideways-looking view camera 15 provides a sideways looking view about the entire circumference of the

device 1"). and/or the display of an inspection result by means of a camera carriage comprising at least two cameras (Figure 2 Cameras 11 and 15) are disposed in a common housing (Figure 1 casing 5) and at least **one of said camera comprising** means for changing the viewing angle **of said cameras to bring each camera into a respective operative state for each camera; said means**[Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single rotation motor 29 mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is roll axis but also rotation of the sideways looking camera 15 about its pitch axis", Therefore the viewing angle of the cameras are changed), characterized in that the means (See Figure 2 and 3) are formed as gimbaled bearings of the housing (Figure 1 Casing 5) with motors (Figure 3 Rotation Motor 29)] for swiveling and/or rotating the housing about at least one first axis that is orthogonal to athe an axis orthogonal to the longitudinal axis (6) of the carriage characterized in that the two cameras (10, 11) are located on the same optic axis (12) with identical **respective lines** of sight in the respective operative states of the cameras (Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single **rotation motor 29** mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is **roll axis** but also rotation of the sideways looking camera 15 about its **pitch axis**"), the method

comprising: using the cameras to inspect a selected pipe section and to document inspection details of the selected pipe section; exposing the circumference of the selected pipe section to the lines of sight of the two cameras; taking a development of the circumference of the inspected pipe section to create a locus of the developed circumference is taken at a separate time from the exposure of circumference to the lines of sight; and automatically assigning one or several of the inspected details to the locus of the developed circumference (Page 3 Second paragraph from the last paragraph states “the sideways-looking field of view camera 15 is capable of capturing entire circumference of the pipe inspection device therefore is a wide-angle lens”). Sefton does not clearly disclose an exposure of a development of the circumference of the inspected pipe section is taken. Wasson discloses the control means 78 transmits image signals B from camera 66 through signal transmitter 82 to remote command center 84. The image signal is sent on to data processing means 86 and presented for viewing on monitor 88. Operator 90 issues commands to command center 84 to generate position signals which are transmitted through signal transmission means 82 to control means 78. One section of the control means 78 is simply electronically actuated switches which control power delivered to the motor means 76 as discussed above in connection with the embodiment shown in FIG. 6. Operator 90 also issues "picture” commands C received by data processor 86 for selecting parameters related to viewing the data on monitor 88. These parameters include selection of the area of the panoramic view to be presented, magnification of the scene. (Col 5 Lines 27 – 47). Therefore it would have been obvious to one ordinary skilled in the art at the time the

invention was made to modify the system of Sefton with a method of inspecting the details of the image captured separately from the exposure development as taught by Wasson. The advantage of doing so is to make the pipe inspection device effective and accurate.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 – 3, 5 – 7 and 9, 11, 13 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sefton et al (GB 2,342,419 A) in view of Wasson (US 6,621,516 B1).

Regarding claim 1, Sefton discloses a camera carriage (Figures 1, 2, 3 Pipe inspection Device 1) with lighting equipment for inspecting piping (Figure 2 Illumination arrays 13 and 17), **the camera carriage comprising:** at least two cameras (Figure 2 Cameras 11 and 15) are disposed in a common housing (Figure 1 casing 5) and at least **one of said camera comprising** means for changing the viewing angle **of said cameras to bring each camera into a respective operative state for each camera; said means**[Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single rotation motor 29 mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of

the forward-looking camera 11about is roll axis but also rotation of the sideways looking camera 15 about its pitch axis", Therefore the viewing angle of the cameras are changed), characterized in that the means (See Figure 2 and 3) are formed as gimbaled bearings of the housing (Figure 1 Casing 5) with motors (Figure 3 Rotation Motor 29)] for swiveling and/or rotating the housing about at least one first axis that is orthogonal to athe an axis orthogonal to the longitudinal axis (6) of the carriage characterized in that the two cameras (10, 11) are located on the same optic axis (12) with identical **respective lines** of sight in the respective operative states of the cameras (Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single **rotation motor 29** mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is **roll axis** but also rotation of the sideways looking camera 15 about its **pitch axis**").

Sefton discloses on page 4 a semi-rigid rod system or a tractor type inspection apparatus is used for carriage of the inspection device but Sefton does not disclose a camera carriage with a running gear.

Wasson disclose in figure 1a pipe inspection device arrays of lens 17 mounted on a running gears 42.

Therefore it would have been obvious to one ordinary skilled in the art at the time the invention was made to incorporate the running gears of Wasson to the pipe

inspection device of Sefton. The motivation to do is to simplify the maneuvering of the pipe inspection device.

Regarding claim 2, Sefton in view of Wasson discloses a camera carriage as claimed in claim 1, including additional means for swiveling and/or rotating the housing about a second axis, parallel to the longitudinal axis of the carriage and orthogonal to the first axis (Sefton, Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single **rotation motor 29** mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is **roll axis** but also rotation of the sideways looking camera 15 about its **pitch axis**").

Regarding claim 3, Sefton in view of Wasson further discloses a camera carriage as claimed in claim 1, including the camera optics of the other camera are oriented in the direction opposite to the camera optics of the at least one camera (Sefton, Page 3 Second paragraph from the last paragraph states "there are two camera views by two different camera, forward-looking field of view camera 11 and sideways-looking field of view camera 15").

Regarding claim 5, Sefton in view of Wasson further discloses a camera carriage as claimed in claim 1 wherein the two cameras are disposed in their optic axes at a specified non-zero angle, for example 45 degrees, with respect to one another (Sefton, Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27

towards opposite ends of the casing 5. A single rotation motor 29 mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is roll axis but also rotation of the sideways looking camera 15 about its pitch axis").

. **Regarding claim 6,** Sefton in view of Wasson further discloses a camera carriage as claimed in claim 1, wherein at least one camera is equipped with a wide-angle lens, in particular a fisheye lens, acquiring a hemispheric space (Sefton, Page 3 Second paragraph from the last paragraph states "the sideways-looking field of view camera 15 is capable of capturing entire circumference of the pipe inspection device therefore is a wide-angle lens").

Regarding claim 7, Sefton in view of Wasson further discloses a camera carriage as claimed in claim 1, wherein at least one camera is equipped with a zoom lens acquiring a limited observation region in great detail and in high resolution (Sefton, Page 4 Second paragraph the user of the device can change the view of the forward-looking view of camera 11 and the user can also control focus therefore the lens used is a zoom lens and since the observation region of the forward-looking camera is limited to captured images in forward direction the image that will be captured will be a high resolution).

Regarding claim 9, Sefton discloses a method for the inspection of pipe sections (Figure 1 Pipe inspection device 1) and/or the display of an inspection result (Page 4 first paragraph "If required an output signal from a sensor can steady the mage shown on the monitor") by means of a carriage (Figure 1 Pipe inspection device 1),

characterized in that, in addition to the documentation of the inspection of details (Outputting signal from a sensor), (Page 3 and Page 4 Paragraph 1 "sideways-looking view camera 15 provides a sideways looking view about the entire circumference of the device 1"). and/or the display of an inspection result by means of a camera carriage comprising at least two cameras (Figure 2 Cameras 11 and 15) are disposed in a common housing (Figure 1 casing 5) and at least **one of said camera comprising** means for changing the viewing angle **of said cameras to bring each camera into a respective operative state for each camera; said means**[Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single rotation motor 29 mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is roll axis but also rotation of the sideways looking camera 15 about its pitch axis", Therefore the viewing angle of the cameras are changed), characterized in that the means (See Figure 2 and 3) are formed as gimbaled bearings of the housing (Figure 1 Casing 5) with motors (Figure 3 Rotation Motor 29)] for swiveling and/or rotating the housing about at least one first axis that is orthogonal to athe an axis orthogonal to the longitudinal axis (6) of the carriage characterized in that the two cameras (10, 11) are located on the same optic axis (12) with identical **respective lines** of sight in the respective operative states of the cameras (Page 3 Paragraph 7 Lines 1 – 3 and Page 4 Lines 1 – 7, "The cameras 11 an 15 are mounted within a rotatable member 23 suspended between bearings 25, 27 towards opposite ends of the casing 5. A single

rotation motor 29 mounted within the casing 5 provides for rotation of the member 23 which brings about rotation not only of the forward-looking camera 11about is **roll axis** but also rotation of the sideways looking camera 15 about its **pitch axis**"), the method comprising: using the cameras to inspect a selected pipe section and to document inspection details of the selected pipe section; exposing the circumference of the selected pipe section to the lines of sight of the two cameras; taking a development of the circumference of the inspected pipe section to create a locus of the developed circumference is taken at a separate time from the exposure of circumference to the lines of sight; and automatically assigning one or several of the inspected details to the locus of the developed circumference (Page 3 Second paragraph from the last paragraph states "the sideways-looking field of view camera 15 is capable of capturing entire circumference of the pipe inspection device therefore is a wide-angle lens").

Sefton does not clearly disclose an exposure of a development of the circumference of the inspected pipe section is taken.

Wasson discloses the control means 78 transmits image signals B from camera 66 through signal transmitter 82 to remote command center 84. The image signal is sent on to data processing means 86 and presented for viewing on monitor 88. Operator 90 issues commands to command center 84 to generate position signals which are transmitted through signal transmission means 82 to control means 78. One section of the control means 78 is simply electronically actuated switches which control power delivered to the motor means 76 as discussed above in connection with the embodiment shown in FIG. 6. Operator 90 also issues "picture" commands C received

by data processor 86 for selecting parameters related to viewing the data on monitor 88. These parameters include selection of the area of the panoramic view to be presented, magnification of the scene. (Col 5 Lines 27 – 47).

Therefore it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the system of Sefton with a method of inspecting the details of the image captured separately from the exposure development as taught by Wasson. The advantage of doing so is to make the pipe inspection device effective and accurate.

Regarding claim 11, Sefton in view of Wasson further discloses a method for the inspection of pipe sections by means of a carriage and/or the display of an inspection result according to claim 9, wherein the exposure of the development is taken during a traversal through the pipe section to be inspected, one direction and at constant speed (Wasson, Col 5 Lines 27 – 47).

Regarding claim 13, Sefton in view of Wasson further discloses a method for the inspection of pipe sections by means of a carriage and/or the display of an inspection result according to claim 9, characterized in that the inspection result is displayed as an image on a monitor, the measuring of a line segment, of a circumference and/or an area takes place by means of a cursor on the monitor image of the circumference development (Wasson, Col 5 Lines 27 – 47).

Regarding claim 14, Sefton in view of Wasson further discloses a method for the inspection of pipe sections by means of a carriage and/or the display of an inspection result according to claim 9, wherein a display of a detail list on the monitor

image, an indication of an element of the detail list and/or of a detail of a circumference development (Sefton, Page 3 Second paragraph from the last paragraph states "the sideways-looking field of view camera 15 is capable of capturing entire circumference of the pipe inspection device therefore is a wide-angle lens") and/or a total image of the circumference development in different image regions takes place simultaneously on the monitor (Wasson, Col 5 Lines 27 – 47 "The plurality of lens array will capture different image regions. See also figure 1").

Regarding claim 15, Sefton in view of Wasson further discloses a method for the inspection of pipe sections by means of a carriage and/or the display of an inspection result according to claim 9, wherein an assignment between the image regions takes place automatically by indicating in an image region (Wasson, Col 5 Lines 27 – 47).

Regarding claim 16, Sefton in view of Wasson further discloses a method for the inspection of pipe sections by means of a carriage and/or the display of an inspection result according to claim 9, wherein the position of a cut for the display of a developed pipe circumference is automatically specified by a gravity sensor (Wasson, Col 5 Lines 27 – 47).

Regarding claim 17, Sefton in view of Wasson further discloses a method for the inspection of pipe sections by means of a carriage and/or the display of an inspection result according to claim 9, wherein image distortions are automatically equalized by means of software into a true image of the pipe circumference (Sefton,

Page 4 Paragraph 1 "Under software control such that their various setting or an image state are memorized").

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sefton et al (GB 2,342,419 A) in view of Wasson (US 6,621,516 B1) in further view of McGrew et al (US 7,073,979 B2).

Regarding claim 8, Sefton in view of Wasson further discloses carriage as claimed in claim 1

The combination Sefton and Wasson does not disclose at least one of the cameras being a thermal imaging camera.

McGrew discloses apparatus for performing maintenance on a sewer pipe. The method includes the steps of detecting with thermal sensor variations in the thermal conditions of the sewer pipe, interpreting the variations in the thermal conditions, and performing maintenance on the sewer pipe based on the detected variations. One exemplary maintenance that may be performed with the method is the reinstatement of lateral pipe openings after the main pipe has been lined or relined. Other exemplary maintenance activities that may be performed in a main pipe with the method and apparatus include inspection of pipe liners, grout inspection, and crack detection. The thermal sensor may be, for example, a thermal imaging camera or an infrared camera or scanner (Col 3 Lines 65 – 67).

Therefore it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the cameras of Sefton with a thermal image camera of McGrew to creates a visual image based on thermal gradients in the pipes or sewer.

The advantage of having a thermal imaging camera is to detect variations in the thermal conditions of the sewer pipe, interpreting the variations in the thermal conditions, and performing maintenance on the sewer pipe based on the detected variations.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SELAM GEBRIEL whose telephone number is (571)270-1652. The examiner can normally be reached on Monday - Friday 8:30 - 5:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571)272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SELAM GEBRIEL/
Examiner, Art Unit 2622

/Sinh Tran/
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